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A Study of the Consumption of Fats and Oils in Minneapolis, 1938

Warren C. Waite and Rex W. Cox
Division of Agricultural Economics

UNIVERSITY OF MINNESOTA
AGRICULTURAL EXPERIMENT STATION

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WARREN C. WAITE AND REX W. COX

THE purpose of this study[1] is to show the variations in the expenditures for and the consumption of fats and oils by families in Minneapolis and to account for the differences. The study is based on the reported consumption of groups of families in various parts of the city, the families having been selected in such a way as to give a good representation of conditions in the city as a whole. In April and May 1938, enumerators called at all homes in 236 selected areas. These areas were distributed fairly evenly in the residential parts of the city, at distances from four to eight blocks apart, as shown in figure 1. The replies given by the housewives to questions about the weekly consumption of fats and oils and about family characteristics constitute the data of the study as reported in this bulletin. Information was obtained from 2,421 families, which included 8,980 persons. In addition, data were obtained from hospitals and restaurants and from 1,319 retail stores at the time of the consumer survey.

The methods followed in this study were similar to those used in earlier studies of the consumption of dairy products and of meats, the results of which were reported in *Minnesota Bulletin 311*, A Study of the Consumption of Dairy Products in Minneapolis, 1934, and *Minnesota Bulletin 321*, A Study of the Consumption of Meats in Minneapolis, 1934. Some time has elapsed between the former studies and this one, but the families are located in the same or neighboring blocks as the families included in the former studies, so there is some comparability between them.

The fats included in the study are butter, margarine, lard, vegetable-oil lard substitutes, salad oils, peanut butter, spreads, and dressings. These have been reduced to a pound basis for the comparison of both prices and quantities. No attempt has been made to reduce these to an actual fat content. It was thought that the analysis would be more significant if the products were compared in the form in which actually purchased, since we are not concerned here with the nutritive or caloric values. The included fats do not constitute all the sources of fats for these families. The chief omissions are cream and fatty meats such as pork

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Table 1. All Fats and Oils: Per Capita Consumption, Price, and Proportions of Total Consumption and Expenditure

Fat or oil	Weekly per capita consumption	Proportion of fats and oils	Average price per pound	Proportion of expenditure
	pounds	per cent	cents	cents
Butter	.67	54.9	33.2	68.6
Margarine	.01	1.0	16.5	0.5
Lard	.13	10.3	12.4	4.4
Substitutes	.16	13.3	18.8	9.3
Salad oil	.02	1.7	30.8	2.3
Peanut butter	.08	6.4	15.6	3.5
Spreads	.01	0.9	33.4	1.1
Dressings	.14	11.5	21.9	10.3

and bacon. These have been omitted because of their purchase for purposes other than directly as a source of fat and because of the difficulty of reducing them to units comparable with those used in the present study. Data on cream consumption were collected, however, in the course of the study and have been used in the explanation of certain points.

VARIATION IN RATES OF CONSUMPTION

The average rates of consumption, prices, and expenditures for the various fats and oils as reported by the consumers are shown in table 1. The dominance of butter in family consumption of fats and oils in this region is at once apparent. Lard substitutes are second in importance, followed by dressings and lard. Spreads, salad oil, and margarine are relatively unimportant. In terms of expenditures, the importance of butter is even greater. Butter is the highest priced of the important fats, the price being about twice that of margarine, one and two-thirds that of lard substitutes, and two and three-fourths times that of lard. Spreads averaged slightly more than butter in price, but the purchases were very small and largely included branded preparations sold in small units.

The results of the consumers' survey are compared with those of the store survey in table 2 on the basis of the proportions of the fats reported purchased by consumers and the fats reported sold by the stores.

Table 2. All Fats and Oils: Proportionate Distribution of Consumption and Retail Sales

Fat	Consumer purchases	Store sales
	per cent	per cent
Butter	54.9	45.7*
Margarine	1.0	3.0
Lard	10.3	11.7
Lard substitutes	13.3	19.0
Salad oils	1.7	1.4
Peanut butter	6.4	6.6
Spreads	0.9	0.8
Dressings	11.5	11.8

* Plus estimated sales by milk distributors.

It seems probable that the reports secured from the retail stores are somewhat more accurate than those secured from the consumers. On this assumption, three important differences appear in the two sets of data. The first is an apparent tendency to overstate but-

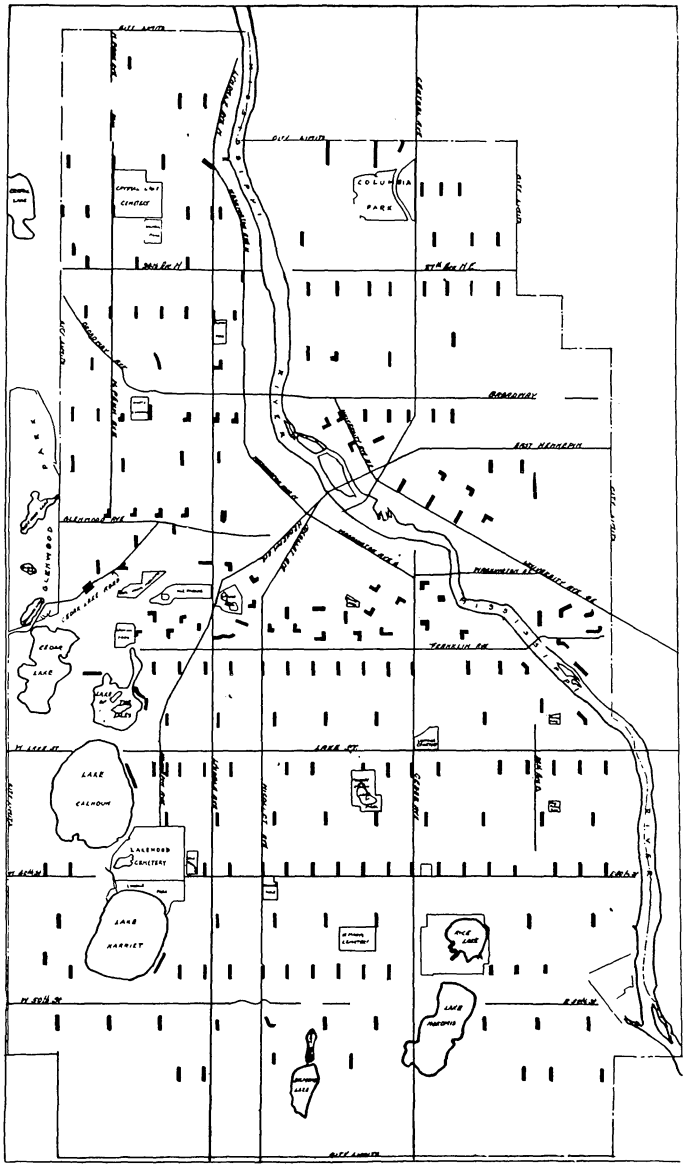

FIG. 1. LOCATION OF AREAS SURVEYED, MINNEAPOLIS 1938

These areas are distributed fairly evenly over the city at distances of four to eight blocks.

ter consumption. Consumers secure butter from other sources than stores and milk distributors, but these sources could hardly account for all of the differences indicated in the two sets of data. A second

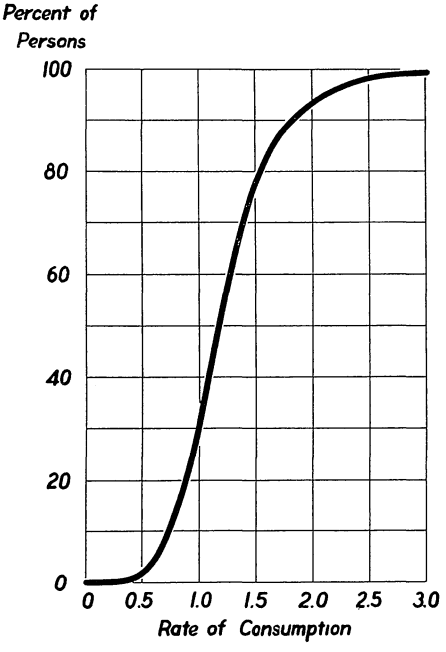

FIG. 2. ALL FATS AND OILS: CUMULATIVE DISTRIBUTION OF PERSONS ACCORDING TO THE PER CAPITA RATES OF CONSUMPTION IN POUNDS WEEKLY

difference is the understatement of margarine consumption by consumers. There is probably some reluctance in reporting margarine consumption because consumers generally feel that this represents a lower level of consumption than butter. This result has also been found in other surveys. The total margarine consumption, however, still remains comparatively small, even though the relative understatement is large. Finally there is the understatement of consumption of lard substitutes by consumers, for which no logical reason is apparent.

Despite these differences, there is no important shift in the rank of the fats so far as total consumption is concerned, except that the consumption of salad oils exceeds that of margarine in the consumers' reports. The analysis following is primarily concerned with the factors responsible for variations in the rates of consumption by different groups. Since there is little reason to suppose that over- or understatement is peculiar to a particular group, it is believed that the comparisons made are valid. When a comparison of the actual rates of consumption of two fats is made, however, it is necessary to modify the degree of emphasis placed on the conclusion in view of the results of the reports from the stores. For example, examination of the consumer reports indicates the consumption of lard substitutes to exceed the consumption of lard on all except the lowest income level. The evidence of the store data would lead one to believe that the consumption of lard substitutes might be greater even on the lowest income level.

The average rates of consumption for the city as a whole are derived from families showing a wide range in per capita consumption. As is shown in table 3, most people were found in groups where the total per capita consumption was between 0.80 and 1.99 pounds per week, nearly 80 per cent of all the people in the survey consuming within this range. Nearly 14 per cent of the people consume at rates

Table 3. All Fats and Oils: Cumulative Distribution of Persons According to Per Capita Rates of Consumption

Rates of consumption	Proportion of total persons
pounds per week	per cent
Less than 0.40	0.3
0.80	13.9
1.20	52.6
1.60	83.0
2.00	93.5
2.40	97.9
2.80	99.4
Less than 3.60	100.0

less than 0.80 pound per week and about 6 per cent at rates of 2.00 pounds or over.

When the consumption of the individual fats is examined on the various levels of total fat consumption, all fats are found to increase as the level of total consumption rises. This suggests that families are more alike in the composition of their consumption than in the amount of fat consumed. General food habits of families in preferring or not preferring a large fat intake thus appear responsible for the large differences in the total per capita consumption rather than an association of large consumption with an individual fat. Table 4 shows the proportions of the fats at various levels of total consumption as reported by consumers. The proportion of butter and lard substitutes declines as the total consumption of all fats becomes greater. The rise in total consumption is due mainly to the larger consumption of lard, spreads, and dressings. Thus, while butter consumption increases from 0.38 pound per capita in the group consuming less than 0.80 pound of total fats to 1.27 pounds in the group consuming over 2.40 pounds of total fats, the butter proportion declines from 58.6 to 48.1 per cent.

FACTORS INFLUENCING PER CAPITA RATES OF CONSUMPTION

The principal factors responsible for variations in the per capita rates of consumption among families appear to be income, composition of family, and nationality. The most important of these factors seems to be income, which influences both the total consumption and the proportion of the various fats and oils consumed. Children consume certain of these products at rates different from adults and in consequence the proportion of fats consumed varies between families of different composition. The popula-

Table 4. All Fats and Oils: Proportionate Distribution of the Consumption of Specified Fats and Oils at Various Levels of Total Consumption

Per capita rate of total consumption	Proportion of total consumption							
	All fats and oils	Butter	Margarine	Lard	Lard substitutes	Salad oils	Peanut butter	Spreads and dressings
pounds weekly	per cent	per cent	per cent	per cent	per cent	per cent	per cent	per cent
Less than 0.80	100.0	58.6	0.8	9.5	12.7	2.6	4.8	11.0
0.80-1.19	100.0	57.4	1.0	8.3	13.9	1.4	6.3	11.7
1.20-1.59	100.0	54.9	0.8	10.7	13.3	1.4	6.6	12.3
1.60-1.99	100.0	53.0	1.2	11.6	13.1	1.7	6.5	12.9
2.00-2.39	100.0	49.1	1.3	13.4	12.4	2.8	7.0	14.0
2.40 and above	100.0	48.1	0.6	14.0	11.7	2.5	8.0	15.1

tion of Minneapolis is predominantly of north European stock and the groups with special consumption characteristics, such as Negroes, Jews, and southern Europeans, are comparatively small. In consequence, differences in nationality probably account for only a minor part of the total variation in fat consumption. The data on nationality as found in the survey are shown, however.

Influence of Income on Consumption

There is a tendency for the consumption of fats and oils to be larger in the high than in the low income groups. Table 5 shows the weekly consumption in the highest income group to be about 13 per

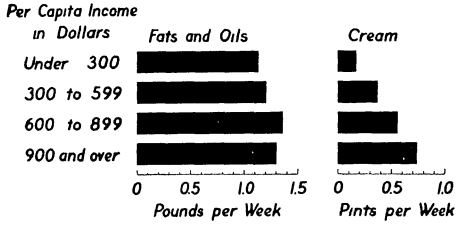

FIG. 3. WEEKLY PER CAPITA CONSUMPTION OF ALL FATS AND OILS, AND OF CREAM ON VARIOUS INCOME LEVELS

cent greater than in the lowest income group. The largest consumption, however, is reported in the next to the highest rather than in the highest income group. This small decline in consumption on the high incomes appears to be due to two causes. The first is the steady increase in the use of cream as income rises, an increase that becomes great enough on the highest income level to displace other fats. The consumption of cream on the highest income level is twice that

Table 5. All Fats and Oils: Weekly Consumption, Cost per Pound, and Expenditures on Various Income Levels

Per capita income	Purchase of fats per week	Cost per pound	Total expenditures per week
	pounds	cents	cents
Under $300	1.14	25.0	28.4
$300-599	1.21	26.4	31.9
600-899	1.36	26.9	37.7
900 and over	1.30	28.0	36.5

of the next to the lowest income level. Cream has not been included in our comparisons because of the difficulty of reduction to a basis comparable with the other fats, but the general situation is indicated in figure 3. The second reason is the probable greater number of meals taken outside the home by the highest income group.

There is also an increase in the average cost per pound of the fats purchased as successively higher income levels are considered. This is indicative of a shift in the proportions of the fats consumed. The difference between the lowest and highest income levels amounts to 12 per cent, which is about the same as the increase in the pounds of fats purchased. The increase in price, however, differs from the increase in amounts in that there is no decline on the highest income level. These two increases combine to produce an even greater increase in per capita expenditures, which are about 28 per cent more on the highest than on the lowest income level.

The expenditures on the fats and oils included were about 12 per cent of the reported food expenditure by the families included in the survey. Despite the increase in expenditure for fats and oils on

the higher income levels, expenditures on other foods increased even more rapidly. In consequence, the proportion of the food dollar expended for fats and oils was smaller on the high than on the low income levels. These changes are shown in table 6.

Table 6. Weekly Expenditures on Foods and on Fats and Oils by Families on Various Income Levels

Per capita income	Weekly expenditure on all foods	Weekly expenditure on fats and oils	Proportion of food dollar spent on fats and oils
	dollars	cents	cents
Under $300	$2.06	28.4	13.4
$300-599	2.62	31.9	12.6
600-899	3.19	37.7	11.8
900 and over	3.63	36.5	10.0

The increase in the average cost of fats purchased gives an indication of the shifts which take place between the sources of fat as the income level rises. There is a tendency for a greater use of the more expensive fats in the high than in the low income groups. This is shown in table 7, which gives the per capita consumption of each of the fats on the various income levels. Butter, lard substitutes, and dressings tend to increase with income, while lard, margarine, and peanut butter decline. These changes are especially marked between the lower income levels. The position of butter is especially important in these changes. Table 5 shows the difference in fat consumption between the highest and the lowest income levels to be about 0.16 pound, but as table 7 indicates this difference is made up of an increase of about 0.23 pound of butter and a decline of nearly 0.07 pound of other fats. The association of the direction of these changes in the consumption and the relative prices of the products results in considerable shifts in the proportions of the expenditures on the various income levels. These proportions are shown in table 8. Also included in the table are the proportions of expenditures as derived from the reports of dealers. The differences from the consumers' reports are somewhat similar to those observed previously, but the general conclusions are substantiated by both sets of data. Roughly, for the whole group, between six and seven tenths of the total expenditures is on butter, more than one tenth on lard substitutes, about one tenth on dressings, and the remainder divided among margarine, lard, salad oil, spreads, and peanut butter.

Table 7. All Fats and Oils: Weekly Per Capita Consumption on Various Income Levels

Per capita income	Butter	Margarine	Lard	Lard substitutes	Salad oils	Peanut butter	Spreads	Dressings
	pounds	pounds	pounds	pounds	pounds	pounds	pounds	pounds
All families	.67	.01	.13	.16	.02	.08	.01	.14
Under $300	.56	.03	.17	.14	.03	.10	.01	.12
$300-599	.66	.01	.12	.17	.01	.08	.01	.14
600-899	.79	.01	.11	.20	.01	.07	.01	.17
900 and over	.79	.00	.08	.17	.05	.06	.01	.16
Average price, cents per pound	33.2	16.5	12.4	19.0	30.9	15.6	33.4	22.0

Table 8. All Fats and Oils: Proportion of Weekly Per Capita Expenditures on Various Income Levels

Per capita income	Butter	Margarine	Lard	Lard substitutes	Salad oils	Peanut butter	Spreads	Dressings	Total
	per cent	per cent	per cent	per cent	per cent	per cent	per cent	per cent	per cent
All families	68.6	0.5	4.4	9.3	2.3	3.5	1.1	10.3	100
Under $300	62.0	1.4	6.8	8.4	2.8	5.1	1.4	12.2	100
$300-599	68.7	0.5	4.8	10.1	1.3	3.9	1.0	9.6	100
600-899	70.8	0.3	3.6	9.9	1.2	2.9	1.0	10.3	100
900 and over	71.7	0.1	2.7	8.7	4.1	2.4	1.0	9.3	100
Store data	60.6	2.0	5.8	14.3	1.8	4.1	1.0	10.3	100

Butter.—Butter, as is indicated in the preceding tables, is the most important fat consumed by these families. It accounts for more than three fifths of the expenditure on all the included fats and no other product accounts for one fourth so large an outlay. Butter is the most widely used of all the fats, nearly all families reporting some consumption. Only 11 families or less than one half of one per cent reported no use of butter. Margarine is ordinarily thought of as the most direct competitor of butter, and it is not surprising to find that the 11 families not using butter reported the consumption of margarine. In addition, 86 other families or about 3.5 per cent of all the families reported the use of some margarine along with butter. It is probable that more families in this group consume margarine than are reported on our records; owing to the agitation against it there is some reluctance to report its use. Even on the basis of the store reports, however, margarine consumption is less than one fifteenth that of butter in terms of pounds, and about one thirtieth as large in terms of expenditure. In view of these data, it is clear that margarine consumption is restricted to comparatively few families. Table 9 shows that the use of margarine is confined largely to the lower income groups.

Table 9. Proportion of Families Using Butter and Margarine on Various Income Levels

Per capita income	Proportion of total families consuming—		
	Butter only	Butter and margarine	Margarine only
	per cent	per cent	per cent
All families	96.0	3.5	.5
Under $300	91.6	7.4	1.0
$300-599	96.0	3.5	.5
600-899	97.5	2.3	.2
900 and over	98.5	1.2	.3

Butter clearly predominates in the use of fats as spreads on bread. There are no exact data on this point, but an indication is provided by comparing with butter the fats ordinarily used as spreads. These products which may be grouped as other spreads are margarine, peanut butter, and the prepared spreads. On the lowest income level the expenditure on these constitutes over 10 per cent of the expenditure on butter, but this proportion declines to about 5 per cent

on the highest income level. The actual expenditure on other spreads is less on the high than on the low income level. It thus appears that

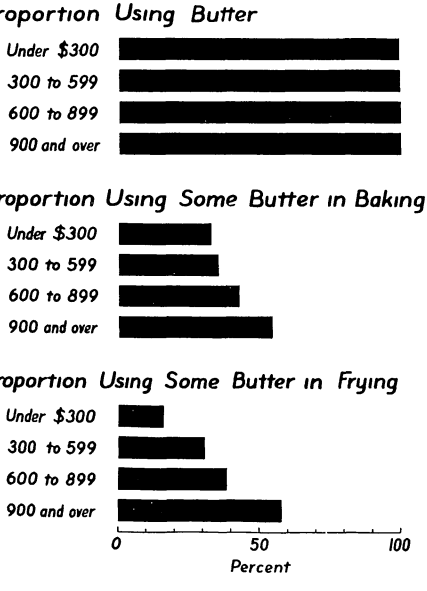

FIG. 4. USE OF BUTTER BY FAMILIES ON VARIOUS PER CAPITA INCOME LEVELS

on the lowest income levels butter is displaced to a slight extent by other lower priced spreads, but even on the lowest income level it remains predominant in this use.

Butter faces a much more serious competition in its use as a fat in cooking. Figure 4 shows the proportion of the families reporting baking and ordinary frying who reported the use of some butter in these operations. On the lowest income level only one third of the families use any butter in baking and about one seventh of the families use it in ordinary frying. On the highest income level only about three fifths of the families use any butter for baking or ordinary frying. In the cooking field, evidently, other lower priced fats predominate over butter and this appears to be true even on the highest income levels. This suggests that the best opportunities for increasing butter consumption lie in expanding its cooking uses.

Lard and lard substitutes.—The consumption of lard substitutes as reported by the consumers exceeds the consumption of lard except for the group on the lowest income levels, despite about a 50 per cent higher cost per pound for the lard substitutes. Even on the low income levels, expenditures for lard substitutes exceed those for lard and for all the families included in the study were more than twice as large. The data secured from the stores indicate a much larger consumption of lard substitutes than that reported by the consumers, and it would appear that the use of substitutes exceeds lard even in

Table 10. Proportion of Families Using Lard and Lard Substitutes on Various Income Levels

Per capita income	Proportion of total families consuming—			
	Lard only	Lard and substitutes	Substitutes only	Neither lard nor substitutes
	per cent	per cent	per cent	per cent
All families	23.5	30.7	42.0	3.8
Under $300	40.0	26.8	31.0	2.2
$300-599	19.9	36.5	40.2	3.4
600-899	19.0	28.1	50.0	2.9
900 and over	18.8	26.3	48.6	6.3

the lowest income group. The bias in the consumer data tends to strengthen the conclusions drawn rather than to weaken them. As is shown in table 10, 66.8 per cent of the families in the low income group use lard, 40 per cent using lard only and 26.8 per cent lard and lard substitutes, but this proportion declines to 45.1 per cent in the high income group. Except in the lowest income group, three fourths of the families use lard substitutes. In the next higher income group the proportion of families using lard exclusively is just half as large, and this decline has been offset by a nearly equal increase in the proportions of families using both lard and substitutes, and using subtitutes only. In the remaining income groups, the proportion of families using lard only remains about the same, but there is a decline in the proportion of families using both lard and substitutes and an increase in the proportion using substitutes only. The declines on the highest income level appear to be due to the substitution of other fats for both lard and lard substitutes. This fat is probably butter, since we find 18 per cent of the families on the highest income level use butter in their baking exclusively as compared with 6.5 per cent on the next lower level.

It thus appears that lard consumption is greatest on the lower income levels, and that there is increasing substitution of lard substitutes for lard on the higher income levels, while on the highest income level butter appears to have taken the place of some of the lard substitutes.

Lard substitutes appear to take the place of lard in all cooking uses. This is shown in table 11, which gives the proportion of the families reporting exclusive use of one of the two products in each important use. About one half of the families reporting baking use either lard or substitutes exclusively in their baking, the other half using some other fat or a combination of fats. The proportion of families using lard is greatest in all uses on the lowest income level and declines steadily as incomes rise. The proportion of families using substitutes exclusively increases with incomes except on the highest income level, where, as we have already indicated, the greater use of butter becomes important.

Table 11. Lard and Lard Substitutes: Proportion of Families on Various Income Levels Reporting Exclusive Use in Different Cooking Operations

Per capita income	2,272 families reporting baking		2,207 families reporting ordinary frying		1,340 families reporting deep frying	
	Using lard exclusively	Using substitute exclusively	Using lard exclusively	Using substitute exclusively	Using lard exclusively	Using substitute exclusively
	per cent	per cent	per cent	per cent	per cent	per cent
Under $300	12.4	37.4	32.6	24.0	50.8	36.9
$300-599	9.7	40.6	17.0	25.6	39.9	36.9
600-899	6.0	42.6	9.8	28.9	35.8	58.6
900 and over	6.0	33.7	5.6	19.4	27.4	52.4

Other fats and oils.—Peanut butter and prepared spreads make up 4.6 per cent of the expenditures on fats by the included families, of which about three fourths is for peanut butter. The consumption of peanut butter declines steadily on successive income levels and is only 60 per cent as great on the highest as on the lowest income level. It probably replaces some butter on the low income levels, but even on the lowest income level the expenditure for peanut butter is less than one twelfth that for butter. The per capita consumption of the other spreads remains about the same on all income levels.

Salad oils and dressings account for about one eighth of the expenditure on the included fats and oils. The bulk of this expenditure is for the prepared dressings. There are irregular shifts between income levels in the consumption of these products.

Influence of Composition of Family on Consumption

The composition of the family appears to have some influence upon the consumption of fats, although it does not result in so large a variation in per capita rates of consumption as the differences in income. To eliminate some of the influence of income upon consumption, the examination of the effect of family composition is made for the single income group with per capita incomes between $300 and $599. This is the largest income group in the study, containing 974 families, including 2,857 adults and 1,357 children.

In general, per capita fat consumption on a given income level decreases as the family becomes larger. An increase in the family size because of a larger number of children results in a greater change than a similar increase in family size because of adults. This is because of the general differences in the rates of consumption by adults and children of the various fats. Table 12 shows the per capita rates for four products in families of differing composition.

Examination of the table in the case of butter shows a decline in per capita consumption as the family increases in size because of more children. Evidently children tend

Table 12. Weekly Per Capita Consumption of Specified Fats in Families of Varying Numbers of Adults and Children and with Per Capita Incomes Between $300 and $599*

Number of children	Number of adults				Number of adults			
	2	3	4	5	2	3	4	5
	Butter				Peanut butter			
	pounds	pounds	pounds	pounds	pounds	pounds	pounds	pounds
0	.74	.74	.73	.67	.06	.05	.06	.05
1	.64	.69	.70	.....	.09	.07	.05	.....
2	.67	.58	.53	.....	.10	.10	.11	.....
3	.57	.52	.....	.....	.09	.09	.....	.....
4	.55	.....	.....	.....	.15	.....	.....	.....
	Lard				Lard substitutes			
0	.26	.11	.15	.14	.15	.18	.16	.14
1	.14	.11	.15	.....	.17	.19	.16	.....
2	.12	.08	.12	.....	.19	.18	.10	.....
3	.09	.08	.....	.....	.17	.17	.....	.....
4	.05	.....	.....	.....	.21	.....	.....	.....

* Averages of groups of less than 10 families have been omitted.

to consume less butter than adults. The per capita rates for lard substitutes are about the same for all compositions of family, indicating a nearly equal consumption of substitutes by adults and children and an increase in family consumption in equal proportion to the numbers in the family. In contrast, consumption of lard appears more nearly constant for families with a given number of adults, and increase in family size because of children does not exert much of an influence on total consumption. There is a consequent decline in per capita consumption as the number of children in the family increases. Peanut butter is a product for which consumption by children exceeds that of adults; in consequence, per capita consumption increases when there are more children in the family and shows little change with an increase in the number of adults. If it is assumed that the consumption by adults in families with children is the same as the consumption by adults in families without children, then the per capita rates of consumption of peanut butter by children must be fully twice that of adults.

Nationality and Consumption

The nationality of consumers has some influence upon food habits and in consequence upon the consumption of the various fats and oils. Table 13 shows the per capita consumption on the $300-599 per capita income level of the various nationalities. The foreign born, also the native born of foreign parents, have been designated according to region of origin. The native white, Scandinavians, British, and north and central Europeans show similarity in the consumption pattern. The southern Europeans show a heavy consumption of the salad oils and more margarine than the other groups. The Jews are distinctive in their avoidance of lard. The low butter consumption appears unusual for this group. Negroes, who are not included in the table, appear to be small consumers of butter but extremely heavy users of lard.

PURCHASED BAKERY PRODUCTS

In addition to the direct purchase of fats and oils previously described, a considerable number of families purchase bakery prod-

Table 13. All Fats and Oils: Per Capita Consumption per Week by Various Nationalities with Per Capita Incomes Between $300 and $599

Product	Nationality						
	Native white	Scandi-navians	British Isles	North European	Central European	Southern European	Jews
	pounds	pounds	pounds	pounds	pounds	pounds	pounds
Butter	.65	.70	.70	.61	.70	.44	.54
Margarine	.01	.01	.00	.00	.00	.06	.00
Lard	.13	.11	.12	.22	.18	.11	.00
Lard substitutes	.16	.18	.13	.15	.15	.22	.13
Salad oil	.01	.01	.02	.02	.03	.33	.06
Peanut butter	.09	.07	.10	.05	.07	.04	.04
Spreads	.01	.01	.01	.02	.01	.03	.00
Dressing	.14	.13	.16	.14	.18	.11	.15

Table 14. Proportion of Families on Various Income Levels Purchasing Bakery Products

Per capita income	Purchased some bakery products	Proportion of families who bought—			
		Pies	Doughnuts	Cakes	Cookies
	per cent	per cent	per cent	per cent	per cent
Under $300	49.6	17.8	72.3	35.2	48.0
$300-599	57.1	15.6	66.0	32.7	59.4
600-899	56.8	13.3	65.5	35.1	66.8
900 and over	53.5	14.0	67.6	40.5	62.6

ucts and in this way increase their fat consumption. Table 14 shows the proportion of families purchasing bakery products and the proportion of the purchasing families buying specified types of products. The purchases are those reported for the week of the survey. The non-purchasing families may and probably do purchase some products at other times. More families bought doughnuts and cookies than cakes and pies. There is also a noticeable shift in purchase with income level, the proportion of families buying cakes and cookies increasing and those purchasing pies and doughnuts decreasing.

CONSUMPTION OF FATS AND OILS BY COMMERCIAL INSTITUTIONS

The relative importance of the various fats in commercial institutions is quite different from that found in the individual families. The relative importance in bakeries, hotels and restaurants, and hospitals is shown in table 15. The proportions are based on data obtained from 28 bakeries, 8 large hotels and restaurants, and 12 hospitals in Minneapolis. The striving for low fat costs is evident in the bakeries, as is shown by the very small proportion of butter and the large use of lard and lard substitutes. These latter constitute about 84 per cent of all the fats and oils used by the bakeries. The use of lard and lard substitutes is about equal, in contrast to the families where the average consumption of lard substitutes was about twice that of lard.

Table 15. Proportionate Distribution of Fats and Oils Used by Bakeries, Hotels and Restaurants, and Hospitals

Fat or oil	Proportion of total		
	Bakeries	Hotels and restaurants	Hospitals
	per cent	per cent	per cent
All fats and oils	100.0	100.0	100.0
Butter	3.7	33.5	85.8
Margarine	0.5	0.0	2.4
Lard	41.4	5.2	3.4
Lard substitutes	42.3	46.0	4.5
Vegetable oils			
Cottonseed	1.9	7.5	0.0
Corn	3.5	3.5	0.0
Other salad oil	1.9	2.7	1.6
Animal oils	2.9	0.0	0.0
Peanut butter	0.0	1.0	2.3
Puff paste	1.9	.6	0.0

Butter consumption is small in hotels and restaurants when compared with the consumption in the ordinary family. This is probably due to somewhat greater economy in its use as a spread and to the greater amount of baking done by hotels and restaurants. In the hotels and restaurants, in contrast to bakeries, lard substitutes are about

nine times as important as lard. The large use of cottonseed oil is indicative of the extent of the use of deep frying in food preparation.

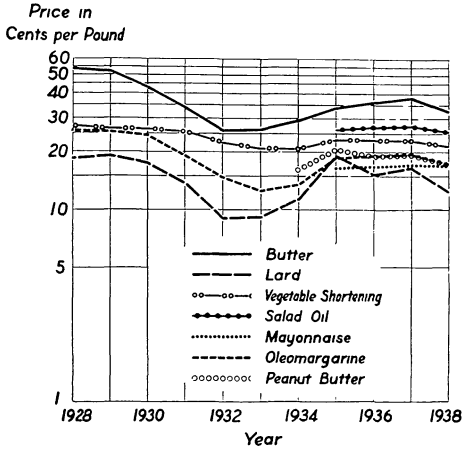

FIG. 5. AVERAGE ANNUAL RETAIL PRICES OF VARIOUS FATS AND OILS, MINNEAPOLIS, 1928-1938

These two groups are again indicative of the restricted use of butter in cooking.

Butter is the principal fat purchased by hospitals. This is due in part to the nature of the diets provided, in which fried and fatty foods are likely to be eliminated, and also to the lack of baking by these establishments.

RETAIL PRICES OF FATS

In general, the ranking of prices of the fats found in this study does not appear to have changed greatly over a period of years. This is indicated in figure 5 which shows the average annual retail price of the commodities reported by the Bureau of Labor Statistics for Minneapolis for the years 1928 to 1938. There have, however, been considerable changes in the relative level of prices. Butter and lard were more variable in price than the other fats. This is especially true when the prices of lard and lard substitutes are compared.

The prices paid by consumers for a particular fat vary over the city because of differences in the quality of the product and types of marketing services. The prices reported by the individual families were not tabulated, but the city was divided into districts in which the major portion of the families corresponded in per capita income to the income groups included in the survey. The prices and quantities sold by the stores located in these areas have been averaged for each district, and these averages are assumed to represent the prices

Table 16. All Fats and Oils: Average Prices per Pound in All Stores by Income Areas

Product	Income group			
	Under $300	$300-599	$600-899	$900 and over
	cents	cents	cents	cents
Butter	32.98	33.28	33.61	34.16
Margarine	16.08	16.94	16.73	15.92
Lard	12.05	12.65	12.59	13.48
Lard substitutes	19.02	18.92	19.41	19.41
Salad oil	23.74	31.07	32.44	33.83
Peanut butter	14.93	15.45	16.56	17.49
Spreads	31.82	33.23	35.20	36.49
Dressings	21.85	21.69	22.85	21.83

paid by persons with the specified incomes. Table 16 shows these average prices. The average prices appear to rise with the income group, and a considerable part of the increase is probably due to better quality.

These average prices are made up of a wide range of prices reported by the individual stores. Figures 6 and 7 show the proportion of the purchases in the income area at specified prices for butter and lard. The differences represent a range in the qualities sold and a variation in the service furnished consumers. They illustrate the difficulties in reporting a single average price for a food product at retail.

The variation in average price according to type of service regardless of location is shown in table 17. The differences in price between types are somewhat greater than is the case with stores classified according to income area. The average price of butter in the small

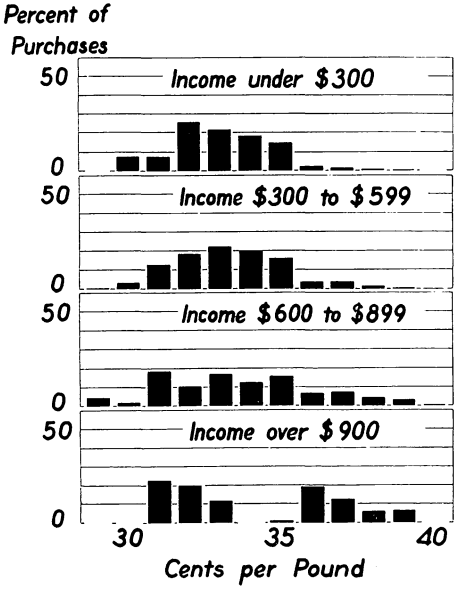

FIG. 6. BUTTER: DISTRIBUTION OF TOTAL PURCHASES IN VARIOUS INCOME AREAS ACCORDING TO PRICE PAID

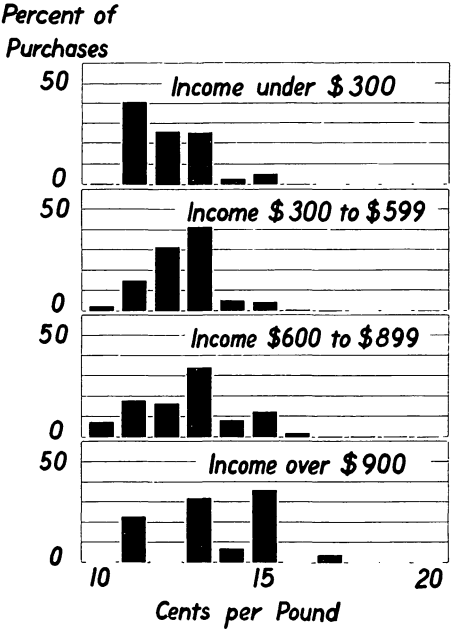

FIG. 7. LARD: DISTRIBUTION OF TOTAL PURCHASES IN VARIOUS INCOME AREAS ACCORDING TO PRICE PAID

cash-and-carry stores, for example, exceeds that in the large cash-and-carry stores by nearly three cents. The large cash-and-carry stores are largely chain stores, the credit-and-delivery stores are the ordinary single-unit proprietary organization, the credit-and-carry stores are the neighborhood stores with no delivery but having a considerable number of charge accounts, and the small cash-and-carry stores are largely apartment groceries. There is naturally a difference in the size of the stores in the included groups which may be judged roughly from the average weekly sales of butter

Table 17. All Fats and Oils: Average Sales Prices in Stores with Various Types of Service

	255 large cash-and-carry stores	568 credit-and-delivery stores	265 credit-and-carry stores	231 small cash-and-carry stores
	cents	cents	cents	cents
Butter	32.1	33.8	34.1	35.0
Margarine	16.3	16.7	17.4	19.0
Lard	11.8	12.6	13.1	13.3
Vegetable oil lard substitutes	18.5	19.3	20.0	21.6
Salad oil	21.9	23.2	19.9	20.5
Peanut butter	14.3	16.3	16.7	18.6
Spreads	31.6	34.3	34.3	34.0

per store. The large cash-and-carry stores averaged 278 pounds of butter sold per week; the credit-and-delivery stores, 167 pounds; the credit-and-carry stores, 53 pounds; and the small cash-and-carry stores, 23 pounds. There is also a range in the prices reported by stores in the same classification with respect to type of service. Figures 8 and 9 show the proportion of the purchases in each type at specified prices for butter and lard. Thus some butter was sold at lower prices in some credit-and-delivery stores than in some cash-and-carry stores. Some of these variations may be accounted for on the basis of differences in the quality of butter sold. It is a common practice, for example, for the larger stores to handle several grades of butter selling at different prices.

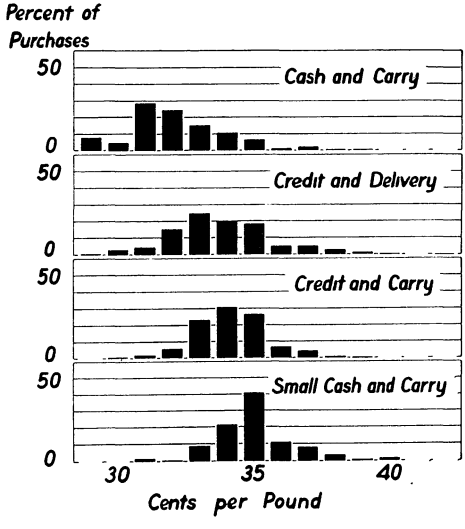

FIG. 8. BUTTER: DISTRIBUTION OF TOTAL PURCHASES FROM VARIOUS TYPES OF STORES ACCORDING TO PRICE PAID

Some of the differences in the fat sales by the types of stores are shown in table 18, which gives the proportion of each kind of fat sold by the different types of stores. The credit-and-delivery stores make slightly over one half the total fat sales by stores; the large cash-and-carry stores, somewhat less than two fifths, and the two smaller types, about one ninth. Comparison of the percentages for the specified fat with those for total fats indicates the differences between types in sales. For example, the credit-and-carry and small cash-and-carry stores are relatively high in the sales of spreads and mayonnaise. The large cash-and-carry stores are high in sales of margarine, boiled dressings, and

Table 18. Fats and Oils: Proportions of Sales for Specified Products by Types of Retail Outlets

	Total sales 1,319 stores	255 large cash-and-carry stores	568 credit-and-delivery stores	265 credit-and-carry stores	231 small cash-and-carry stores
	per cent	per cent	per cent	per cent	per cent
All fats	100.0	36.5	52.0	8.3	3.5
Butter	100.0	38.4	51.2	7.6	2.8
Margarine	100.0	49.8	48.2	1.9	0.1
Lard	100.0	40.6	50.3	6.9	2.2
Lard substitutes	100.0	36.0	55.3	7.1	1.6
Salad oil	100.0	33.4	54.6	9.1	2.9
Mayonnaise	100.0	29.3	55.5	10.0	5.2
Peanut butter	100.0	38.6	51.1	7.7	2.6
Spreads	100.0	31.9	51.0	11.6	5.5
Boiled dressing	100.0	43.4	48.8	5.9	2.9

lard and have a slightly higher proportion in the sales of butter. The credit-and-delivery stores run somewhat higher than the other groups in the sales of lard substitutes.

CONCLUSIONS

The Minnesota farmers' interest in the fat and oil market is primarily concerned with butterfat and lard. Butterfat and hogs now provide over half the income from the sale of farm products in the state. The market for hogs is considerably influenced by the price of lard. Both of these products meet strong competition in parts of the general market.

The results of this study apply directly only to the included families and may not hold true for other places. These families are largely of northern European extraction. Many come from farms or have close contact with farms, and they live in a region where butter prices are likely to be low relative to other fats, and in which region there is considerable emphasis on the importance of the dairy industry. These factors result in a higher than average butter consumption. The general results are, however, sufficiently striking to indicate that they apply to a considerable proportion of the

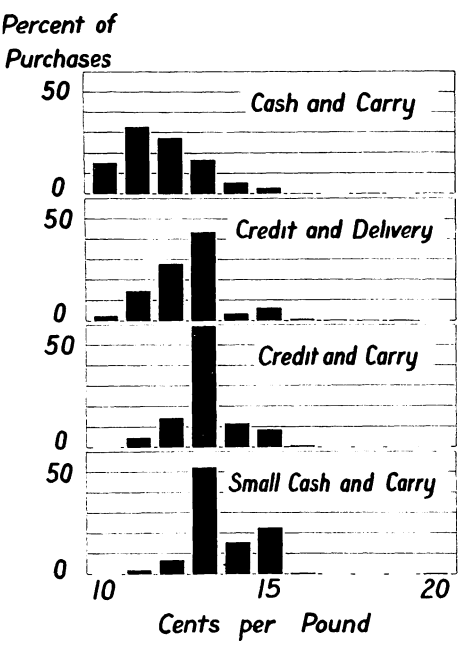

FIG. 9. LARD: DISTRIBUTION OF TOTAL PURCHASES FROM VARIOUS TYPES OF STORES ACCORDING TO PRICE PAID

families in the northern parts of the United States.

Butter predominates among all the fats both in quantity and importance in the consumers' expenditure. It appears to have very small displacement in its use as a spread, and this is only among the lowest income groups. Even on the lowest income level the consumption of margarine was less than 5 per cent that of butter, and spreads and peanut butter, which are in part complementary, were about 2 per cent and 18 per cent, respectively. Butter consumption is higher in each successive income group included in the study. It is in the cooking field that butter suffers its heaviest competition. In this field it finds extensive use only in the high income groups. In the low income groups and in commercial baking, where competition is keen and costs must be kept low, other fats are used. Increased butter consumption would thus appear to depend largely on either higher consumer incomes or a more extensive use in the cooking field.

Lard appears to compete largely on the basis of low price. It finds extensive use only in the lowest income groups and in bakeries where it may have superiority over other fats in pastry. The ordinary housewife appears to prefer the substitutes even at their higher prices, as evidenced by the changes in the relative proportions as the income level is higher. The prospects for greater lard consumption are not good unless technical developments enhance its competitive position relative to the substitutes.